



Your Partner for a Healthy Community

Environmental Health Division
401 Harris B. Dates Drive, Ithaca, NY 14850
(607) 274-6688; Fax (607) 274-6695

Preliminary Report August 12, 2004 Investigation of Hunt Hill/Midline Road well microbiological contamination

Introduction

Barriers to microbiological contamination of a well are the **hydrogeology** of the area, the **well construction** and maintenance, and the location and intensity of a **source of contamination**.

Hydro-geological risk factors include steeper slopes, gravel soil or shallow fractured bedrock, shallow ground water, and streams, lakes and ponds.

Well construction risk factors include shallow well depth, lack of grouting for shallow wells, lack of proper sanitary seals where pipes pass through the casing and at the well head, poor drainage away from the well head, high withdrawal rates compared to well yield, and poor maintenance of these items. In addition, a cross-connection to a unprotected source (such as a hose submerged in a puddle or a pool, or lack of an air gap on the backwash line from a water softener) increases the risk of contamination.

Contaminant source risk factors include larger sources and those closer to the well. Contaminant sources can include surface waters such as stormwater runoff (from a roof, a driveway, animal yard, etc), a lake, pond or stream, or underground such as a sewage system. Sources of contamination directly uphill of a well provide high risk. Some examples of separation distances from household wells contained in the draft New York State Well Construction Standards are appended

An investigation of a contaminated well incident usually begins with a lab sample positive for total coliform bacteria, followed by shock disinfection to clear up transient contamination of well or plumbing. An on-site sanitary survey follows if the contamination is not cleared up. The survey is intended to identify risk factors at and near the well. An investigation may spread out from there if the evaluation indicates the problem is more widespread.

Summary of Investigation

September-October 2003

- Based on a complaint of illness and an unsatisfactory microbiological sample, a sanitary survey of the well at 730 Midline Road was completed. The buried casing was extended above grade at this time.

October-December 2003

- Shock disinfection failed to clear the well, so dye was placed in the neighbor's sewage system twice; composite analyses of the well were negative for dye. The sewage system, however, was not in use after the dye was introduced.
- A sample from the well serving that neighbor's house was also positive for bacteria, but since it was never shock disinfected no further investigation could be done.

March 2004

- TCHD recommended that the owners of 730 Midline Road install permanent disinfection.

June 2004

- The TCHD agreed to look further into the well contamination.

July-August 2004

- Two composite water samples from the well were negative for dye after dye was placed in the sewage system at 730 Midline Road.
- Three microbiological samples from the well were all negative.
- Five samples of the streams, from Cornelius Road to opposite 730 Midline Road, showed only small differences between the sites for Nitrogen, Total Coliform and Fecal Coliform. The Nitrogen levels were all <1 mg/l, the Total Coliform <1500 /100ml, and the Fecal Coliform <200/100ml at two sites and <500 at three sites. (The Standards are 10 mg/l, 2400/100ml, and 200/100ml. The microbiological standards are based on 5 samples in a month, so the single sample does not indicate a violation of standards nor a gross contamination.)
- Discussions with the person who installed a sewage systems at 483 Hunt Hill Road in the 1960's revealed the system was a septic tank followed by a seepage pit, constructed of cinder or cement blocks sitting on the excavated ground. Such a pit typically does not have a constructed "bottom" as the intention is for the liquid in the pit to be absorbed into the surrounding ground. The contractor who pumped the tank in (probably) 1998 does not recall what he observed at that time or what he said.

Preliminary Findings as of August 12, 2004;

- Microbiological contamination appears limited in area to the properties of 730 Midline Road and 483 Hunt Hill Road.
- Microbiological contamination appears transitory in time.
- The source of contamination is unknown.
- Potential sources that appear low risk are the well head construction, the sewage system at 730 Midline Road, and the streams under normal flow conditions.

Additional Evaluations

Several additional potential contamination sources will still be evaluated. These include the Town Highway Disposal site along Hunt Hill Road, the sewage system(s) at 483 Hunt Hill Road, and impacts due to flooding of the stream across the property at 483 Hunt Hill Road. Recent access to the 483 Hunt Hill Road property had not been achieved yet.

Attachment 1: Summary of Well Water Quality Results

Attachment 2: Table from Draft Appendix 5-B of Title 10 of NYCRR, Required Minimum Separation Distances to Protect Water Wells From Contamination. Note that these are draft; are more strict than the current recommended or required distances, and more strict than any recommendations that existed at the time of constructing the wells at 730 Midline Road and 483 Hunt Hill Road.

Attachment 3: Location and results of stream water samples

Prepared by John M. Andersson, P.E.

Director, Division of Environmental Health Services

a:HuntHillRoad12Aug04.p20

Summary of Well Water Quality Results

730 Midline Road, T-Dryden (samples collected by TCHD)

Date	Total Coliform/100ml	E. Coliform	Notes
11/4/03	<1	negative	sample by owner same day was pos. for TC, neg. for EColi
11/20/03	4	positive	sample by owner same day was negative for TC
7/20/04	<1	negative	
7/30/04	<1	negative	
8/6/04	<1	negative	

Other wells sampled:

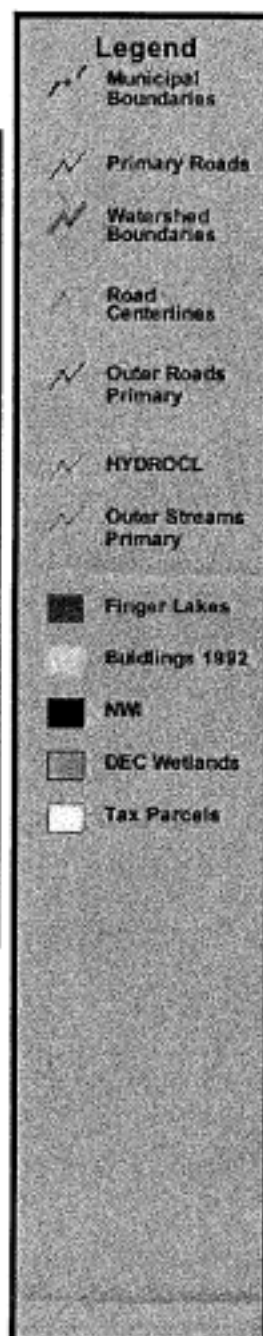
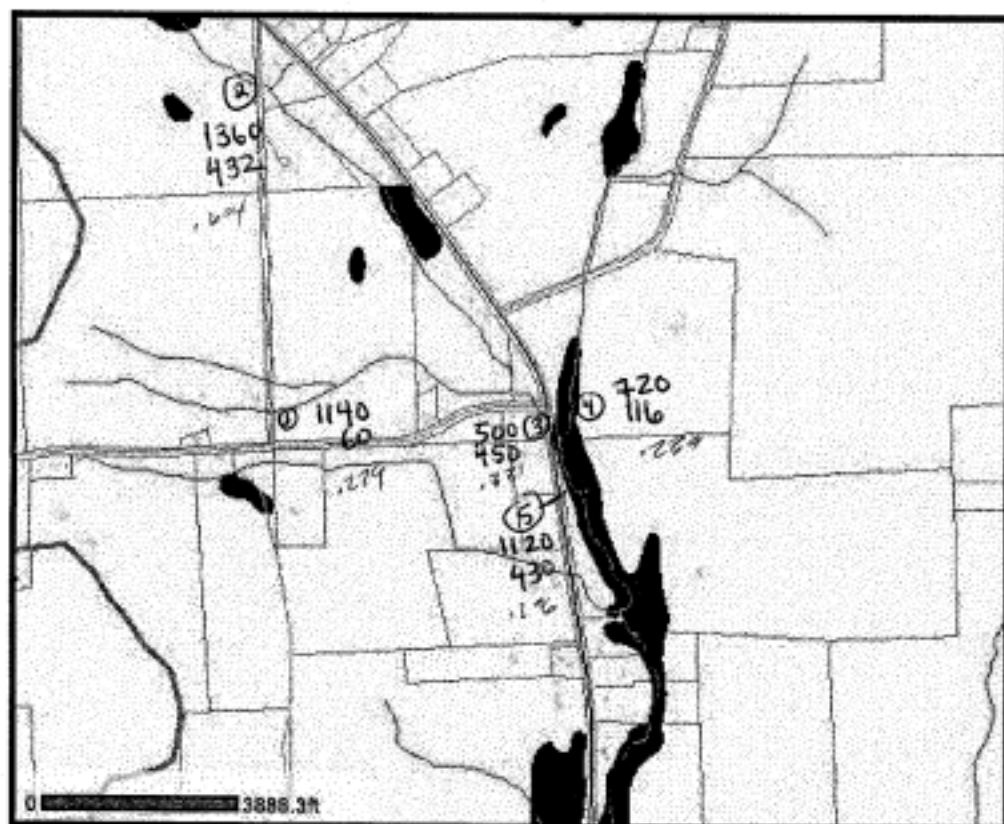
700 Midline Road and 465 Hunt Hill Road on May 4, 2004, by owner; both <1 Total Coliform
483 Hunt Hill Road on 12/4/03 by TCHD, 4 Total Coliform/100 ml and E. Coliform positive.

Required Minimum Separation Distances to Protect Water Wells From Contamination

Contaminant Source	Distance (Feet) ¹
Landfill waste disposal area, or hazardous or radiological waste disposal area ²	300
Land surface application or subsurface injection of liquid or solid manure spreading	300
Barnyard, silo, barn gutters, animal pens and manure piles	200
Cesspools	200
Wastewater treatment absorption systems located in coarse gravel or in the direct path of drainage to a well	200
Seepage pit ³	150
Absorption field or bed ³	100
Septic system subsurface treatment systems ³	100
Intermittent sand filter without a watertight liner ³	100
Sanitary Privy pit ³	100
Surface wastewater recharge absorption system for stormwater from parking lots, roadways or driveways ³	100
Cemeteries	100
Effluent line to distribution box	50
Sanitary privy with a watertight vault	50
Sanitary sewer or combined sewer	50
Septic tank or aerobic unit	50
Stream, lake, watercourse or wetland	50
Surface water recharge absorption system (i.e., basin, dry well)	50
All known sources of contamination otherwise not shown above	100

Notes for Table 1:

1. The listed water well separation distances from contaminant sources shall be increased by 50% whenever aquifer water enters the well water system at less than 50 feet below grade. If a 50% increase in separation distances is not available, then the greatest possible separation distance shall be provided with such additional measures as needed to prevent contamination.
2. Water wells shall not be located in a direct line of flow from these items, nor in any contaminant plume created by these items, except with such additional measures (e.g., sentinel groundwater monitoring, hydraulic containment, source water treatment) as needed to prevent contamination.
3. When these contamination sources are located in coarse gravel or upgrade and in the direct path of drainage to a water well, the water well shall be located at least 200 feet away from the closest part of these sources.



total coliform /100 ml
 fecal coliform /100 ml
 Nitrate as N, mg/l



Tompkins County
Hydrography/Water Resources

Samples Collected 7/22/04 by TCRD